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Filed: 15 September 2006

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES  
(Senior Administrative Patent Judge McKelvey)

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ROBERT H. **GRUBBS**  
and MATTHIAS SCHOLL,

Junior Party  
Application 09/576,370),

v.

STEVEN P. **NOLAN**  
and JINKUN HUANG,

Senior Party  
(Application 09/392,869).

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Patent Interference No. 105,373  
Technology Center 1600

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Before McKELVEY, *Senior Administrative Patent Judge*, and HANLON  
and NAGUMO, *Administrative Patent Judges*.

NAGUMO, *Administrative Patent Judge*.

**DECISION -- Interlocutory Motions -- Bd.R. 125(b)**

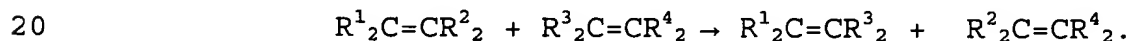
**I. Introduction**

This interference concerns certain species of metathesis  
catalysts known in the art as "second generation Grubbs  
5 catalysts." Generally, Grubbs catalysts are notable for their

ability to promote metathesis reactions in a great variety of  
olefins, including olefins substituted with polar functional  
groups and active hydrogen atoms. As a result, they have become  
used in many areas of chemistry, ranging from polymerization  
5 reactions to natural product syntheses. The Nobel Prize in  
Chemistry for 2005 was awarded to Yves Chauvin, Robert H.  
Grubbs, and Richard R. Schrock for their discoveries relating to  
the development of the metathesis reaction in organic synthesis.

This abbreviated introduction is intended to orient the  
10 non-chemical reader to the technical background of the  
interference. It is based primarily on the Advanced Information  
on the Nobel Prize in Chemistry 2005 (5 October 2005), provided  
by the Royal Swedish Academy of Sciences (GX 2012)<sup>1</sup>. This  
section does not constitute findings of fact on which we base  
15 our decision: formal findings of fact are set out in the body of  
this opinion.

Olefin metathesis involves the formal exchange of the  
carbene (divalent carbon, or R<sub>2</sub>C=) groups between two olefins,  
e.g.,



(The other combinations of R<sub>2</sub>C moieties are possible; the  
distribution of products depends on the thermodynamics and the

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<sup>1</sup> Grubbs exhibits are cited as "GX 200X".

kinetics of the reactions.) In 1992, following extensive work by many different research groups, Grubbs<sup>2</sup> published the first well-defined ruthenium carbene complex that functioned as a metathesis catalyst. These catalysts, which have the formula



polymerize norbornene, a strained cyclic olefin, via a metathesis reaction. They remain active in the presence of polar molecules, including alcohols and water. The complex is shaped like a triangular bipyramid in which the two chloride  
10 ("Cl") moieties and the diphenylvinylcarbene ("=CH-CH=CPh<sub>2</sub>") moiety lie in an approximate equatorial plane with the ruthenium, while the two triphenylphosphine (PPh<sub>3</sub>) moieties are bonded to the ruthenium along an axis vertical to the chloro-diphenylvinylcarbene plane. In subsequent research, Grubbs  
15 discovered that the substitution of cyclohexyl ("Cy") groups for the phenyl groups attached to phosphorus, and the substitution of the simpler phenylcarbene, =CHPh, for the diphenylvinylcarbene resulted in simply prepared, stable catalysts that remained very active in the presence of polar  
20 functional groups such as -OH. These catalysts became commercially available, and were adopted in many areas of organic synthesis ranging from ring opening metathesis

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<sup>2</sup> Only the principal investigator's name is used. In each case, other members of the research groups were involved.

polymerizations to the synthesis of complicated antibiotic analogues of natural products. These catalysts came to be known as "first generation Grubbs catalysts."

Detailed studies of the mechanism of the reaction indicated that the dissociation of one of the phosphine ( $\text{PR}_3$ ) groups was a critical step in the reaction. The search for catalysts having longer active lives led to the development of ruthenium complexes in which the axial phosphines are replaced by N-heterocyclic carbenes ("NHC"). More active catalysts were soon found in which only one of the phosphines was replaced by an NHC. In the words of the Royal Swedish Academy of Sciences:

In Grubbs' catalysts containing only one such ligand the dissociation rate of the remaining phosphine is increased, increasing metathesis activity. Similar results were published almost simultaneously by S.P. Nolan and by A. Fürstner and Herrmann in 1999. The new, more reactive, catalysts are called second generation Grubbs catalysts.

(GX 2012 at 6; emphasis added.)

The present interference concerns a particular species of "second generation Grubbs catalyst" in which the N-heterocyclic carbene has two nitrogens in a five-membered saturated ring (i.e., a ring that contains no double bonds), and in which the "equatorial" carbene is a vinylcarbene having the structure,  $=\text{C}(\text{R})\text{CH}=\text{C}(\text{CH}_3)_2$ .

Only Grubbs filed a motion. The parties did not request oral argument.

For the reasons given below, Grubbs' motion to deny the benefit accorded to Nolan for priority is GRANTED.

5 **II. Findings of Fact**

Junior Party Grubbs

1. Grubbs is involved in this interference on the basis of original application 09/576,370 ("370 application," GX 2016), which was filed on 22 May 2000, and titled "Imidazolidine-based  
10 metal carbene metathesis catalysts. (Paper 1 at 3.)

2. The inventors listed for Grubbs are Robert H. Grubbs and Matthias Scholl. (Paper 1 at 3.)

3. Grubbs' real party-in-interest is identified as the California Institute of Technology. (Paper 7 at 2.)

15 4. The 370 application claims the benefit of priority under 35 U.S.C. § 119(e) of:

U.S. Provisional Application 60/135,493 (GX 2001, "493 provisional application"), filed 24 May 1999;  
and

20 U.S. Provisional Application 60/142,853 (GX 2002, "853 provisional application"), filed 7 July 1999.

5. The 370 application states that the 493 and 853 provisional applications are "incorporated herein by reference in their entireties." (GX 2016 at 1, first paragraph.)

6. Grubbs has been accorded the benefit for priority of  
5 the 853 provisional application. (Paper 1 at 3.)

7. Grubbs has NOT been accorded the benefit for priority of the 493 provisional application. (Paper 1 at 3.)

Senior Party Nolan

8. Nolan is involved in this interference on the basis of  
10 original application 09/392,869 (GX 2013, "869 application"), which was filed on 9 September 1999, and titled "Catalyst complex with carbene ligand." (Paper 1 at 4.)

9. The inventors listed for Nolan are Steven P. Nolan and Jinkun Huang. (Paper 1 at 4.)

15 10. Nolan's real-party-in-interest is identified as the University of New Orleans Foundation. (Paper 11 at 1.)

11. The 869 application claims the benefit of priority under 35 U.S.C. § 119(e) of:

U.S. Provisional Application 60/099,722 (GX 2015,  
20 "722 provisional application"), filed 10 September 1998;

and

U.S. Provisional Application 60/115,358 (GX 2014,  
"358 provisional application"), filed 8 January 1999.  
(GX 2013 at 1.)

12. At the declaration of this interference, Nolan was  
5 accorded the benefit for priority of the 358 provisional  
application. (Paper 1 at 4.)

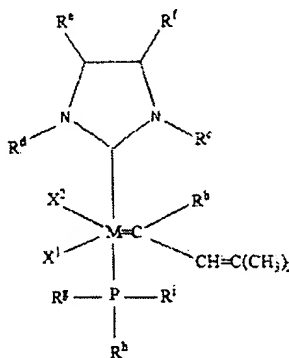
13. Nolan has NOT been accorded the benefit for priority  
of the 722 provisional application. (Paper 1 at 4.)

The Count and Claims of the Parties

10 14. The only count in this interference is Count 2, which  
reads (Paper 31 at 5-7 (Appendix 1)):

Count 2

A composition of matter having the formula:



15 where:

M is Ru or Os;

X<sup>1</sup> and X<sup>2</sup> are each independently an anionic ligand;

P is phosphorus

$R^g$ ,  $R^h$  and  $R^i$  are each independently

- (1) a  $C_{1-10}$  alkyl group,
- (2) a  $C_{3-10}$  cycloalkyl group or
- (3) a  $C_{5-20}$  aryl group;

5  $R^b$ ,  $R^c$ ,  $R^d$ ,  $R^e$  and  $R^f$  are each independently

- (1) hydrogen,
- (2) a  $C_{1-20}$  alkyl group,
- (3) a  $C_{2-20}$  alkenyl group,
- 10 (4) a  $C_{2-20}$  alkynyl group,
- (5) an aryl group,
- (6) a  $C_{1-20}$  carboxylate group,
- (7) a  $C_{1-20}$  alkoxy group,
- (8) a  $C_{2-20}$  alkenyloxy group,
- (9) a  $C_{2-20}$  alkynyloxy group,
- 15 (10) an aryloxy group,
- (11) a  $C_{2-20}$  alkoxycarbonyl group,
- (12) a  $C_{1-20}$  alkylthiol group,
- (13) a  $C_{1-20}$  alkylsulfonyl group or
- (14) a  $C_{1-20}$  alkylsulfinyl group,

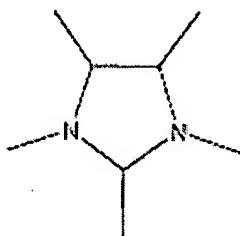
20 where each of  $R^b$ ,  $R^c$ ,  $R^d$ ,  $R^e$  and  $R^f$  is optionally  
substituted with

- (a) halogen,
- (b) a  $C_{1-10}$  alkyl group,
- (c) a  $C_{1-10}$  alkoxy group,
- 25 (d) an aryl group,
- (e) a hydroxyl group,
- (f) a thiol group,
- (g) a thioether group,
- (h) a ketone group,
- 30 (i) an aldehyde group,
- (j) an ester group,
- (k) an ether group,
- (l) an amino group,
- (m) an amido group,
- 35 (n) an imino group,
- (o) a nitro group,
- (p) a carboxylic acid group,
- (q) a disulfide group,
- (r) a carbonate group,
- 40 (s) an isocyanate group,
- (t) a carbodiimide group,



- (u) a carboalkoxy group or
- (v) a carbamate group.

15. For the present decision, the critical structure is the upper ligand,



5

which is a "saturated" nitrogen-containing heterocyclic nucleophilic carbene that is a derivative of imidazolidine.

16. In lay terms, the upper ligand is a five-membered ring, two members of which are substituted nitrogen atoms, while  
10 the remainder of the ring atoms are carbon. The "carbene" carbon is in the ring between the two nitrogen atoms. The ring is said to be "saturated" because it contains no double bonds. Accordingly, although not shown, the carbons bonded to one  
another at the top of the structure are each bonded to a  
15 hydrogen atom in addition to the groups  $R^e$  and  $R^f$ .

17. The claims of the parties are:

Grubbs: 1-64

Nolan: 9, 11-14, 17-21, 23-40, 43-65, 71-73,  
and 77-111

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18. The claims of the parties that correspond to Count 2  
are:

Grubbs: 1-39 and 41-64

5 Nolan: 9, 11-14, 17-21, 23-40, 45, 46, 51-62,  
71, 73, 77, 78, 89-92, and 107-109

19. The claims of the parties that do not correspond to  
Count 2 and that are therefore not involved in this interference  
are:

10 Grubbs: 40

Nolan: 43, 44, 47-50, 63-65, 72, 79-88, 93-106,  
110, and 111

Motions

20. Of the eight motions Grubbs was deemed to have  
15 proposed, authorization to file was denied for four; three  
motions were deferred, and one was authorized. (Paper 44  
at 3-6.)

21. Grubbs filed one motion, styled "Grubbs Motion 5."  
(Paper 45); Nolan opposed (Paper 46), and Grubbs replied  
20 (Paper 47).

22. Of the three motions Nolan proposed, one was  
authorized, one was denied authorization, and one was deferred.  
(Paper 44 at 6.)

23. Nolan did not file its authorized motion.

Grubbs Motion 5

24. Grubbs Motion 5 seeks judgment denying the benefit for priority accorded to Nolan of the Nolan 358 provisional application. (Paper 45 at 2.)

5 25. Grubbs seeks various forms of relief. (Paper 45 at 2.)

26. Grubbs urges that the 358 provisional application fails to enable osmium or ruthenium complexes where ligand L<sup>1</sup> is a saturated nucleophilic carbene as recited in Count 2.

10 (Paper 45 at 3.)

27. Grubbs urges further that the 358 provisional application fails to describe any embodiments of complexes having a saturated nucleophilic carbene ligand as recited in Count 2. (Paper 45 at 3-4.)

15 28. In particular, Grubbs submits that the 358 provisional application is "completely silent with regard to complexes having imidazolidine-based (i.e., *saturated*) ligands." (Paper 45 at 16, *emphasis original*.)

20 29. Grubbs points to several places in the 358 provisional application that describe unsaturated nucleophilic carbene ligands and unsaturated imidazole complexes with ruthenium. (Paper 45 at 24, facts 5, 6, 8-10, and 12.)

30. Nolan opposes Grubbs' motion, arguing that some of the relief requested was not authorized, or has been deferred.  
(Paper 46 at 1-2.)

31. Nolan further contends that the 869 application does  
5 teach the invention to those of ordinary skill in the art.  
(Paper 46 at 2.)

32. Nolan makes no argument that the 358 provisional application teaches an embodiment within the scope of Count 2.

33. On our own review of the disclosure of the 358  
10 provisional application we do not find a description or teaching of a ruthenium or osmium complex containing a saturated imidazolidene based carbene ligand.

34. Indeed, we do not find any description of a saturated imidazolidene based carbene or a saturated precursor in the  
15 disclosure of the 358 provisional application.

#### Discussion

"Accord benefit means Board recognition that a patent application provides a proper constructive reduction to practice under 35 U.S.C. § 102(g)(1)." Bd.R. 201. Constructive  
20 reduction to practice means a described and enabled anticipation under 35 U.S.C. § 102(g)(1) in a patent application of the subject matter of a count. Bd.R. 201; see also *Squires v. Corbett*, 560 F.2d 424, 433, 194 USPQ 513, 519 (CCPA 1977) ("proof of a prior constructive reduction to practice of a

species would be enough evidence to prevail on priority even as to a generic invention.") Whether a disclosure provides an adequate written description of subject matter within the scope of a count is a question of fact. The Standing Order provides  
5 that "[a] specification of an involved application or patent is admissible as evidence only to prove what the specification or patent describes." S.O. ¶ 152.2.1 (3 January 2006) (Paper 32 at 45); see also Paper 2 at 15 (S.O. ¶ 19, 13 September 2004).

Grubbs shows, and our own review confirms, that there is no  
10 apparent disclosure of a ruthenium complex that contains a saturated imidazolidine based ligand as required by Count 2. Accordingly, we find that Grubbs has established a *prima facie* case that Nolan's 358 provisional application does not provide a written description of an embodiment within the scope of the  
15 Count. Nolan fails to direct our attention to any evidence that the 358 provisional application describes a ruthenium or osmium complex containing a saturated imidazolidene based ligand that is within the scope of the Count. Therefore, we hold that the 358 provisional application does not provide a constructive  
20 reduction to practice of an embodiment within the scope of the Count. We need not reach Grubbs' arguments regarding the alleged lack of enablement of such a species.

Grubbs seeks a number of remedies, of which only the first, denying Nolan the benefit of the filing date of the 358

application, 9 January 1999, is appropriate. Because Grubbs' earliest accorded benefit date, 7 July 1999, is now earlier than Nolan's, Grubbs is the senior party. As for the other remedies, Grubbs has failed to establish any basis (and we know of none) to cancel any claims or subject matter of claims in Nolan's 869 application, let alone to force abandonment of that application, merely because priority documents fail to describe an embodiment within the scope of the count.

Summary

As a result of this decision, the interference will be redeclared in a separate paper with Grubbs as the senior party.

**IV. Order**

In view of the foregoing considerations, it is:

ORDERED that Grubbs Motion 5 is GRANTED.

FURTHER ORDERED that the benefit accorded to Nolan of the filing date of U.S. Provisional Application 60/115,358 is WITHDRAWN.

FURTHER ORDERED that the attentions of the parties are directed to the REDECLARATION, Paper 57, which is mailed on the same date as this Decision.

FURTHER ORDERED that a copy of this DECISION shall be placed in the files of U.S. Application 09/576,370 and U.S. Application 09/392,869.

FURTHER ORDERED that an ORDER setting times for taking action to determine priority will issue in due course.

FURTHER ORDERED that if there is a settlement not of record in this interference, the attentions of the parties are directed to 35 U.S.C. § 135(c) and Bd.R. 205.

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/ss/ Fred E. McKelvey )  
FRED E. McKELVEY )  
Senior Administrative Patent Judge )

15

/ss/ Adriene Lepiane Hanlon ) BOARD OF  
ADRIENE LEPIANE HANLON ) PATENT  
Administrative Patent Judge ) APPEALS AND  
INTERFERENCES )

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/ss/ Mark Nagumo )  
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Administrative Patent Judge )

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